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10/074,415	02/12/2002	Silke Goronzy	450117-03753	7004

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EXAMINER

SKED, MATTHEW J

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/074,415

Applicant(s)

GORONZY ET AL.

Examiner

Matthew J Sked

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/12/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The abstract of the disclosure is objected to because of the use of the use of legal phraseology specifically "said target language". Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities: the specification is missing the headings: "BACKGROUND OF THE INVENTION", "DESCRIPTION OF THE RELATED ART", "SUMMARY OF THE INVENTION", "BRIEF DESCRIPTION OF THE DRAWINGS", and "DETAILED DESCRIPTION". Also on page 2, line 31 "spoekn" should be changed to --spoken--.

Appropriate correction is required.

### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities: on lines 5 and 6 "accentd" should be changed to --accented--.
4. Claim 2 is objected to because of the following informalities: "is -in at least a preprocessing step-" should be changed to --is, in at least a preprocessing step,--.
5. Claim 8 is objected to because of the following informalities: on line 2, "(RS) should be changed to --(SR)--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

7. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The examiner notes that the claims appear to be a rough translation of a foreign language and are therefore replete with vague and indefinite language and should be revised carefully. The following represent some examples:

Claim 1 states "said given target language and/or dialect native speaker", however the claim does not previously mention a native speaker. For the purposes of examination it will be assumed the limitation should read "said given target language and/or dialect of a native speaker".

Claims 1 and 7 states "a recognizing system" on lines 7 and 35 respectively, however a recognizing system is already claimed on lines 4-5. This is a double inclusion and for the purposes of examination the limitation on lines 7 and 35 should read --said recognizing system--.

Claims 1 and 5 state "in particular" however this phrase is indefinite and should be deleted.

Claims 2 and 3 state "said given source language and/or dialect", however the previous claim does not make any mention to a source dialect. For the purposes of examination it will be assumed the limitation states "said given source language".

Claims 4 and 7 state "pronunciation invariants and/or rules", however sets of pronunciation variants and/or rules are already claimed in the independent claim 1. For the purposes of examination it will be assumed the limitation should read –said sets of pronunciation invariants and/or rules".

Claim 5 states "pronunciation variants are generated by applying said derived pronunciation rules", however this contradicts claim 1 which states "derived pronunciation variants and/or rules". For the purposes of examination it will be assumed that pronunciation variants are generated from pronunciation rules only in the case when both variants and rules are derived in the first claim.

Regarding claims 9 and 10, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. In the present instance, claim 10 recites the broad recitation "n-gram structure", and the claim also recites in particular a "bi-gram structure", which is the narrower statement of the range/limitation.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 5-7, 9-12, 15, 16, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Humphries ("The Use of Accent-Specific Pronunciation Dictionaries in Acoustic Model Training"), cited by the applicant.

As per claims 1, 19 and 20, Humphries teaches a method, system and computer program product for generating pronunciation variants, in particular for a process of recognizing speech, in at least one given target dialect (generates a pronunciation dictionary for American accented speech from a British pronunciation dictionary, pg. 317, col. 2, 1<sup>st</sup> paragraph),

wherein speech of at least one and with respect to said given target dialect of a native speaker is analyzed using a recognizing system to derive pronunciation variants for in particular accented speech in said target dialect (uses American speech data to build a phonological model using a British speech recognizer, this model would include variants of the British model, page 318, 1<sup>st</sup> column, 1<sup>st</sup> paragraph);

wherein a recognizing system is used which is designed for and trained in at least one given source language (British recognizer trained on British accented pronunciations of English, page 317, col. 2, last paragraph).

10. As per claim 2, Humphries teaches the recognizing system is – in at least a preprocessing step – trained in at least said given source language (recognizer is trained prior to the generation of the American speech dictionary hence a preprocessing step, page 317, col. 2, last paragraph).
11. As per claim 3, Humphries teaches the source language and/or dialect is used for training (British English recognizer trained from British accented pronunciations of English, page 317, col. 2, last paragraph).
12. As per claim 5, Humphries teaches the new pronunciation variants are generated by applying derived pronunciation rules to a given starting lexicon for said target language, in particular for a recognition process for said target language (uses pronunciation derivation observations to build trees to obtain the information to create the new pronunciation dictionary, page 317, 2<sup>nd</sup> col., 3<sup>rd</sup> paragraph).
13. As per claim 6, Humphries teaches a canonical lexicon is used as said starting lexicon in which pronunciation variants and/or rules only of native speakers of said target language are initially contained (canonical pronunciation dictionary, Fig. 1).
14. As per claim 7, Humphries teaches the recognition system, which is specific for said source language, is employed for generating pronunciation variants and/or rules (recognizer is specific for British accented English, pg. 317, col. 2, last paragraph).
15. As per claim 9, Humphries teaches said recognition system for generation pronunciation variants contains or is based on at least a phone loop structure for recognizing sequences of phones, phonemes, and/or other language subunits or the like (phone loop recognizer, Fig. 1).

16. As per claim 10, Humphries teaches the recognition system for generation pronunciation variants and/or rules is restricted by a bi-gram structure and trained on said source language (recognizers use a bi-gram language model, page 318, col. 1, 1<sup>st</sup> paragraph).

17. As per claim 11, Humphries teaches the speech of a variety of speakers of the target dialect as a native or mother language is analyzed so as to further increase the set of pronunciation variants for said target language (uses utterances from 10 American speakers, page 319, col. 2, 4<sup>th</sup> paragraph).

18. As per claim 12, Humphries teaches training in advance of a process for recognizing speech based on training data, in particular by evaluating a given speech data base of said target language or dialect (builds American accent model in respect to the British recognizer using a set of utterances, page 317, col. 2, last paragraph).

19. As per claim 15, Humphries teaches a method for recognizing speech for the target language wherein the method for generating pronunciation variants is involved (builds an accent-specific recognizer from the new pronunciation dictionary, page 318, col. 2, last paragraph).

20. As per claim 16, Humphries teaches the generation of pronunciation variants is carried out at least in part as a pre-processing step to the recognizing of speech (uses adapted pronunciation dictionary for later recognition tasks, scenario 2, page 319, col. 1).



***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claim 4, 13-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Humphries.

Humphries does not teach the sets of pronunciation variants and/or rules are derived from said analysis in each case as pronunciation variants and/or rules of speakers of said source language as a mother tongue or native language trying to speak said target language as a foreign language.

However, the Examiner takes Official Notice that it is notoriously well known in the art that people speaking a foreign language would pronounce speech differently from those who are native to the language. Therefore, it would have been obvious to one of ordinary skill in the art to modify the system of Humphries to be used to modify a recognizer for users who are not native to the recognition language because this would increase recognition accuracy in environments where many people of different native tongues would be using the recognition system such as an airport.

23. As per claims 13 and 17, Humphries teaches training by a speaker of said target language as a native or mother tongue (uses American speech data, page. 317, col. 2, last paragraph).

Humphries does not teach training during the application.

However, the Examiner takes Official Notice that real-time adaptation of language models are notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Humphries to train during the application because this would allow the system to continually learn hence giving better recognition as time progresses.

24. As per claim 14, Humphries teaches evaluating said recognition process and in particular the recognition results (compares dictionaries by analyzing corresponding pronunciations, page 318, col. 1, paragraph 3, Fig. 2). Adjusting the probability thresholds for the multiple pronunciations (page 318, col. 1, paragraph 2) suggests the analysis of the recognition results is used therefor.

25. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Humphries in view of D'hoore (U.S. Pat. 6,085,160).

As per claim 8, Humphries does not teach the recognition system for generating pronunciation variants at least one language model and a Hidden Markov Model, which is particularly trained on said source language, in particular by native speech.

D'hoore teaches a language independent speech recognizer that is robust to variations due to accent (col. 7, lines 19-31) which uses both a language model and an acoustic model based on Hidden Markov Models (Fig. 4, elements 47 and 49 and col. 3, lines 22-25).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Humphries to use both a language model and a Hidden Markov Model in recognition as taught by D'hoore because, as taught by

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D'hoore, this would allow phonemes that appear in multiple languages or dialects to be represented together with one representation in memory (col. 4, lines 46-55), hence saving memory and speeding up processing.

26. As per claim 18, Humphries does not teach a variety of different source languages or target languages is involved.

D'hoore teaches a language independent speech recognizer that is robust to variations due to accent (col. 7, lines 19-31) that can be trained on a variety of languages and dialects (col. 4, lines 56-62).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Humphries to use a variety of different source languages or target languages as taught by D'hoore because it increase the usefulness of the system for more users hence making it more marketable.

### ***Conclusion***

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Frasca et al. (U.S. Pat. 6,832,191) teaches a method for adapting a multi-lingual speech recognizer to recognizer a new language. Kipp et al. ("Automatic Detection and Segmentation of Pronunciation Variants in German Speech Corpora") teaches another method for determining pronunciation variants in speech recognition.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (703) 305-8663. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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